

Chapter Four: Forecasts of Aviation Activity

INTRODUCTION

Effective planning for the future of Vermont's aviation system requires an understanding of anticipated future levels of aviation activity. This chapter focuses on forecasting aviation activity for the State, both commercial and general aviation. Projections have been developed for a 20-year period, using 2005 as a base year, through 2025. These forecasts are subsequently utilized in the facility analyses.

The assumptions and methodologies used to prepare aviation demand projections for the airports included in the Vermont Airport System Plan are discussed in the following sections:

- Socioeconomic Conditions
- Industry Trends
- Forecast Approach and Considerations
- General Aviation Projections
- Commercial Service Activity Projections
- Military Activity Projections
- Summary

SOCIOECONOMIC CONDITIONS

A complete analysis of Vermont's aviation system must include an inventory of the basic social and economic characteristics of the State. With an understanding of the composition of Vermont's population and employment, effective long-term planning for aviation facilities may begin.

POPULATION

Vermont is a relatively small state both geographically and according to population. Vermont is comprised of 14 counties, covering less than 10,000 square miles, making it the 45th largest state by land mass. It is the only New England state that doesn't have a coastline along the Atlantic Ocean.

The population of Vermont in 2004 was estimated by the U.S. Census Bureau to be approximately 621,394 people. This was an increase of approximately 11,500 persons since the 2000 Census, and a 10-year increase of 32,392 as depicted in **Table 4-1**. Vermont's population, while growing, has not grown as fast as the United States' population over the same period. Between 1995 and 2004, Vermont's population increased at a compound annual growth rate (CAGR) of 0.54 percent, about half of the growth rate seen in the U.S. over the same 10 years. The portion of the U.S. population living in Vermont has remained steady, decreasing slightly from 0.22 to 0.21 percent over the same period of time.

Table 4-1
Historic Vermont and U.S. Population

Year	Vermont Population	U.S. Population	VT % of U.S.
1995	589,002	265,471,847	0.22%
1996	593,701	268,582,017	0.22%
1997	597,239	271,818,977	0.22%
1998	600,416	275,040,082	0.22%
1999	604,683	278,195,745	0.22%
2000	608,827	282,192,162	0.22%
2001	612,964	285,102,075	0.21%
2002	616,500	287,941,220	0.21%
2003	619,343	290,788,976	0.21%
2004	621,394	293,655,404	0.21%
CAGR 95-04	0.54%	1.01%	

Source: U.S. Census Bureau

Vermont Airport System and Policy Plan

According to the U.S. Census Bureau's 2004 estimates, nearly one-quarter of the people of Vermont live in Chittenden County. Burlington, located in Chittenden County, is the largest city in Vermont with an estimated 38,934 people. **Table 4-2** presents populations projections for the 14 counties in Vermont through 2020 using the 2000 U.S. Census data as a base year, as provided by the Massachusetts Institute for Social and Economic Research (MISER). Vermont is projected to grow between 2005 and 2020 at an average annual rate of 0.41 percent, slightly less than its historic average annual rate of growth of 0.54 percent of the past 10 years. This is still significantly less than that of the U.S., which is anticipated to grow at a compound annual rate of 0.86 percent over the same course of time.

Table 4-2
Population Projections by County

County	2000*	2005	2010	2015	2020	CAGR '05-'20
Addison	35,974	37,052	37,907	38,805	39,813	0.48%
Bennington	36,994	37,295	37,420	37,530	37,694	0.07%
Caledonia	29,702	30,455	31,121	31,816	32,550	0.44%
Chittenden	146,571	152,846	157,471	161,491	165,813	0.54%
Essex	6,459	6,603	6,711	6,848	6,981	0.37%
Franklin	45,417	47,617	49,583	51,701	54,065	0.85%
Grand Isle	6,901	7,423	7,923	8,433	8,958	1.26%
Lamoille	23,233	24,442	25,601	26,756	27,898	0.89%
Orange	28,226	28,976	29,544	30,122	30,737	0.39%
Orleans	26,277	26,899	27,453	28,009	28,562	0.40%
Rutland	63,400	63,936	64,255	64,637	65,030	0.11%
Washington	58,039	59,141	59,931	60,636	61,322	0.24%
Windham	44,216	45,093	45,769	46,455	47,171	0.30%
Windsor	57,418	58,154	58,553	58,960	59,446	0.15%
Vermont	608,827	625,935	639,241	652,199	666,041	0.41%

Source: Massachusetts Institute for Social and Economic Research

* 2000 U.S. Census

EMPLOYMENT

A primary function of this Airport System Plan is to measure the current usage and predict the future reliance of Vermont's citizens on its system of aviation facilities. One measure of the relative prosperity of Vermont's citizens is to examine the employment and unemployment patterns in the State. **Table 4-3** shows the labor force and employment characteristics for Vermont over the last 10 years. Vermont has experienced slow employment growth over the past 10 years, but unemployment rates for the State have been dropping since 2002. Total persons employed have increased at a higher rate than the labor force in Vermont since 1995, driving the unemployment rate down over this period. As of June 2005, the unemployment rate in Vermont was 3.3 percent, lower than the national average of 5.0 percent.

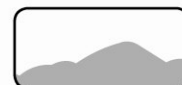
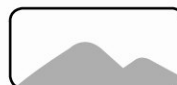


Table 4-3
Historic Labor Force, Employment
and Unemployment Rate

Year	Labor Force	Employment	Unemployment	Unemployment Rate (%)
1995	320,600	306,800	13,700	4.3
1996	326,400	312,200	14,200	4.4
1997	331,700	319,500	12,200	3.7
1998	333,100	323,300	9,700	2.9
1999	335,000	326,300	8,800	2.6
2000	337,800	328,600	9,200	2.7
2001	343,300	330,500	12,800	3.7
2002	350,200	334,600	15,600	4.4
2003	353,500	338,400	15,100	4.3
2004	354,700	342,000	12,700	3.6
2005*	356,150	344,250	11,900	3.3
CAGR 95'-	0.9%	1.0%	-1.2%	-2.0%

Source: Vermont Department of Labor

*June 2005

Employment projections for each of the 14 counties in Vermont are presented in **Table 4-4**. The Vermont Department of Labor (VDOL) does not provide employment projections on a county level. As a result, the compound annual growth rate from Woods and Poole's employment projections for each county for 2005 through 2025 was applied to the current employment as reported for June 2005 by the VDOL, and extrapolated throughout the planning period. Woods and Poole, Inc. is a highly respected and trusted source of socioeconomic data and projections used by many public and private agencies. The compound annual growth rate for all of Vermont provided from Woods and Poole for the planning period was 1.03 percent, which is comparable to the 1.1 percent compound annual growth rate as determined by the VDOL for the years 2002-2012. The U.S. total employment is projected to grow slightly faster with an annual rate of growth of 1.4 percent, for the years 2002-2012. Table 4-4 shows each county's projected employment through 2025. On a statewide level, employment is projected to increase at an average annual rate of 1.0 percent, continuing the same pattern of growth as the last 10 years.

Table 4-4
Employment Projections by County

County	2005*	2010	2015	2025	CAGR 05'-25'
Addison	20,550	22,217	24,019	28,075	1.6%
Bennington	19,900	20,875	21,899	24,098	1.0%
Caledonia	16,800	17,827	18,918	21,303	1.2%
Chittenden	86,300	91,325	96,642	108,223	1.1%
Essex	3,350	3,403	3,458	3,569	0.3%
Franklin	25,100	26,459	27,891	30,992	1.1%
Grand Isle	4,000	4,313	4,650	5,406	1.5%
Lamoille	14,900	15,876	16,916	19,204	1.3%
Orange	16,000	16,863	17,772	19,740	1.1%
Orleans	14,600	15,359	16,158	17,883	1.0%
Rutland	34,550	35,431	36,334	38,211	0.5%
Washington	30,900	32,089	33,324	35,938	0.8%
Windham	25,150	26,344	27,595	30,278	0.9%
Windsor	32,100	33,790	35,569	39,413	1.0%
Vermont	344,250	362,299	381,293	422,323	1.0%

Source: *2005 Vermont Department of Labor

CAGR 05'-25' provided by Woods and Poole 2005

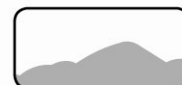
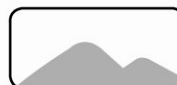
INDUSTRY TRENDS

In order to predict how Vermont's aviation activity may grow over the planning period, it is important to have an understanding of trends in the aviation industry that may impact growth, either positively or negatively. Trends for the general aviation and commercial industries are discussed below.

GENERAL AVIATION

General aviation refers to a broad category of aviation activity and includes all operators with the exception of airlines and the military. General aviation activity occurs at each airport in Vermont's system, including Burlington International, the largest commercial service airport in the State. The health of the national general aviation industry, and trends related to general aviation pilots, aircraft, and users, are important factors that can impact activity levels and facility development needs at general aviation airports across the country, including Vermont.

A pronounced decline in the general aviation industry began in 1978 and lasted throughout the 1980s and into the mid-1990s. This decline resulted in the loss of over 100,000 manufacturing jobs and a drop in aircraft production from approximately 18,000 annually to only approximately 930 in 1994. A dramatic drop in the number of new student pilots was also experienced over this period. Factors



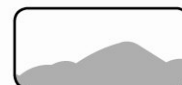
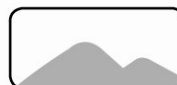
contributing to the decline in general aviation included liability claims against aircraft manufacturers, the loss of Veterans Benefits that covered many costs associated with student pilot training, and a recessionary economy.

Enactment of the General Aviation Revitalization Act (GARA) of 1994 provided significant relief to the general aviation industry primarily as a result of an 18-year statute of repose that it placed on the manufacture of all general aviation aircraft and their components. Previously, there had been no time limit to filing liability claims. Positive impacts of the GARA are reflected in national statistics that indicated an increase in general aviation activity, an increase in the active general aviation aircraft fleet, and an increase in shipments of fixed-wing general aviation aircraft. In addition, since 1994, annual general aviation shipments and total billings have each more than doubled.

More recently, the terrorist attacks of September 11, 2001, and the ensuing recessionary national economy had a dampening impact on positive general aviation industry trends. Significant restrictions were placed on general aviation activity following the attacks and these restrictions resulted in severe limitations being placed on general aviation operators in many areas of the country. Many of those restrictions have now been lifted and most segments of general aviation activity, including business and corporate aviation, have rebounded and continue to experience positive trends.

On an annual basis, the FAA publishes forecasts that summarize anticipated trends in most components of civil aviation activity, including general aviation. Each published forecast revisits previous activity forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of forecasts, some of the most important of which are U.S. and international economic growth and anticipated trends in fuel costs. These forecasts were published in March 2005 and included an assumed spike in oil costs during the first quarter of 2005 after which oil prices were assumed to decline in 2006 and experience moderate increases through the projection period. Should the relatively high cost of oil experienced at the time of writing of this report, November 2005, continue, the projected activity growth identified in the FAA forecasts may be impacted.

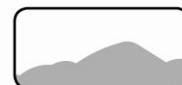
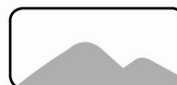
FAA forecasts generally provide one of the most detailed analyses of historic and forecasted aviation trends and provide the general framework for examining future levels of aviation activity for the nation as well as in specific states and regions.



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Those general aviation trends identified in FAA's most recent forecasts, *FAA Aerospace Forecasts, Fiscal Years 2005-2016*, that are most likely to impact general aviation in Vermont include the following:

- Continued growth in corporate aviation including fractional ownership, a market that has experienced strong growth but is only minimally developed, and on-demand air taxi services.
- Continued entry of new commercial manufacturers, such as Cirrus and Eclipse, into the general aviation aircraft market.
- Continued growth in the number of amateur-built experimental aircraft in the general aviation fleet, a component of the general aviation fleet whose numbers have increased from 2,100 in 1970 to over 30,000 in 2004.
- An increase in the number of pilots and interest in flying as a result of the Sport Pilot and Light Sport Aircraft Rule. Sport pilot regulations cover the training and certification requirements of sport pilots, sport flight instructors, light sport aircraft, and light sport aircraft repairmen. Sport pilots require less training and have fewer privileges than private pilots, including limiting flight privileges to day visual flight rule (VFR) conditions. Sport aircraft must meet specific design restrictions, including limits of two seats, a maximum gross take-off weight of 1,320 pounds and a maximum level flight speed of 120 knots. The number of pilots with a sport pilot certificate is forecasted to increase at an average annual growth rate of 4.3 percent from 2005 through 2016.
- Growth in jet aircraft activity associated with the introduction of micro jets, representing a new aircraft market, to the active general aviation fleet. Micro jets, also known as very light jets, merge new jet engine technologies and sophisticated avionics equipment to create advanced jet aircraft, capable of carrying between four and six passengers, at an acquisition cost significantly lower than previous jet aircraft.



Vermont Airport System and Policy Plan

Forecasts of national general aviation activity developed by FAA can be summarized as follows:

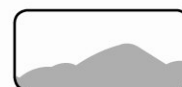
- Growth in the active general aviation aircraft fleet at an average annual rate of approximately 0.8 percent from 2005 to 2016, including these anticipated average annual growth rates in the following aircraft categories:
 - Single-engine piston – 0.2 percent
 - Multi-engine piston – decline of 0.2 percent
 - Turboprop – 1.2 percent
 - Turbojet – 5.6 percent
 - Rotorcraft – 1.1 percent
- Total general aviation hours flown are projected to increase at an average annual rate of 1.5 percent between 2005 and 2016. The strongest growth, approximately 6.9 percent annually, is anticipated in the turbojet category as a result of the introduction of micro jets and the continued strong growth in fractional ownership aircraft which have high utilization rates.
- The total population of pilots is projected to increase at an average annual rate of approximately 1.5 percent between 2005 and 2016. The strongest growth is anticipated in the student pilot category.

These trends, forecasts, and their anticipated impact on Vermont's general aviation airports and users are considered in conjunction with State-specific general aviation and demographic trends to develop the State airport system forecast of aviation demand.

Commercial Airline Industry Trends

The U.S. airline industry is currently in a state of crisis. Deregulation of U.S. airlines in 1978 changed the once-stable industry into an ultra-competitive, cost-driven business with little room for underperformers. Currently, several air carriers are either operating under Chapter 11 bankruptcy or in danger of doing so. In 2005, record-high oil prices put further strain on already-struggling carriers. Carriers are now forced to make crucial alterations to their business plans in order to survive. In short, the airline industry is currently undergoing tumultuous change.

Beginning in 2000, the "dot-com" bust was well underway and a general economic downturn had begun. When coupled with the terrorist attacks of September 11, 2001, a new era of airline industry woes in the U.S. was ushered in. The industry witnessed a significant decline in demand for air travel. Both business and leisure



travelers began seeking cheaper airfares. Increased fuel costs, fewer travelers, and the high airline labor costs began the worst airline industry downturn in U.S. history. These events substantially impacted traditional carriers such as United, Delta, TWA, and American. At the same time, the new entrants and long-term low-cost giant, Southwest, stayed their course, continuing to make money despite the economy.

In 2001, the events of September 11th led to loss of over \$8 billion in the U.S. airline industry, even after accounting for \$5 billion in government stabilization payments. In 2002, passenger demand for air travel did not return, even though carriers cut fares while trying to reduce costs. The total loss for all U.S. airlines in 2002 topped \$11 billion. The Air Transport Association reported that U.S. carriers lost approximately \$32.3 billion between 2001 and 2004, and that 2004 was the fourth consecutive year of continued losses for its airlines.

In order to reduce losses and stabilize itself, the U.S. airline industry continues to undertake dramatic cost cutting strategies. Many of the high-cost traditional hub-and-spoke carriers have noted that they have to change the way they do business in order to stay in business. Many of the major U.S. airlines use the traditional hub-and-spoke model, which is designed to extract relatively high airfares from passengers while offering seamless travel around the world.

The excessive expenses of the hub-and-spoke model took their toll on the largest airlines during the recent downturn. Major airlines in the U.S. had no choice but to reduce costs, cut capacity, and restructure their business models. Nationwide, aircraft were parked, retired, or returned to lessors and manufacturers. Along with heavy financial losses and massive layoffs experienced by nearly all carriers, US Airways filed for bankruptcy in mid-2002 and United followed in December 2002 after failing to negotiate necessary wage and salary decreases with its employees. Many other carriers, including America West, depended on the government loan guarantees after September 11th to keep them out of bankruptcy. Several carriers, including Vanguard, Midway, and National Airlines, could not sustain the losses incurred and went out of business. Trans World Airlines (TWA) was bought by American, which eventually reduced TWA's traditional hubbing operation at St. Louis.

In 2003 the war in Iraq further strained both traffic and U.S. air carriers' bottom lines. US Airways emerged from bankruptcy in early 2003, but was forced to reenter bankruptcy in September 2004. During its reorganization, US Airways reduced its hubbing operation in Pittsburgh and demoted it to a "focus city." America West also felt the pressure as it introduced a new price structure and abandoned its small hub in Columbus, Ohio. In 2005, these two airlines merged to form one airline, now named US Airways.

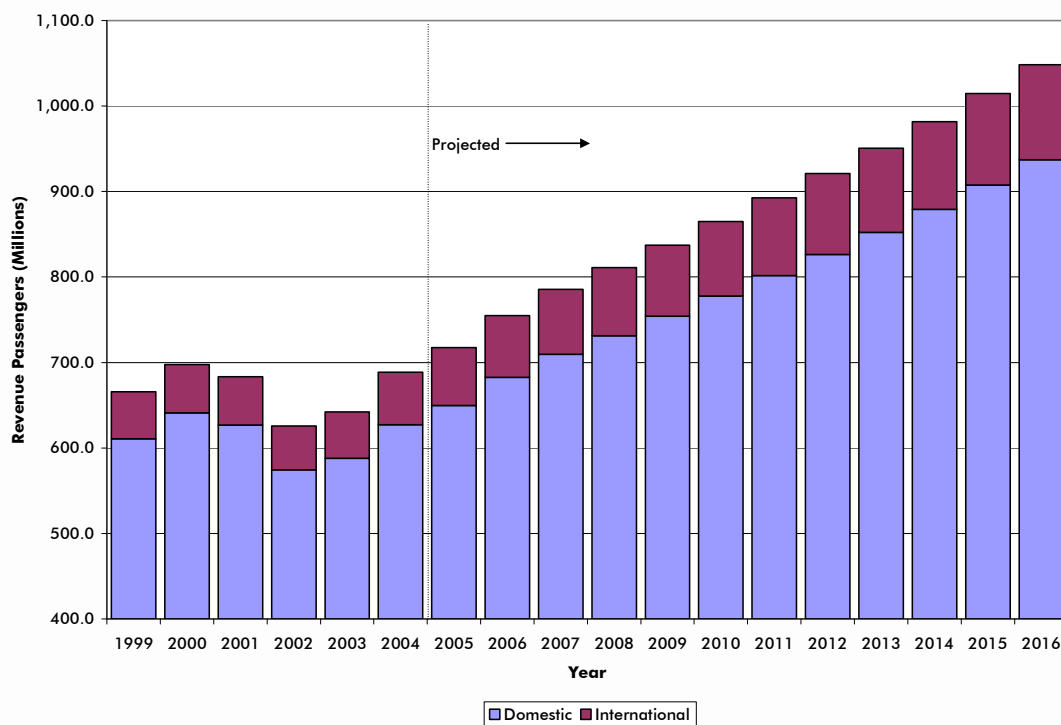


Vermont Airport System and Policy Plan

The re-emergence of leaner, strengthened carriers with lower costs will put pressure on the other large carriers to cut their labor and operating costs. As the largest airlines gain more control of their expenses, they are becoming more competitive with Southwest Airlines and other discount airlines such as JetBlue.

While U.S. air carriers have struggled, growth in annual passengers in the commercial aviation system has returned to a pattern of annual growth, largely because of lower fares. According to the FAA's *Aerospace Forecasts Fiscal Years 2005-2016*, domestic passenger totals in 2004 rebounded to pre-9/11 levels, and growth is forecast to exceed 3.5 percent on a compound annual basis. A considerable source of this growth is in international passengers, which are expected to grow in excess of five percent (compounded) through 2016. **Exhibit 4-1** illustrates this potential growth.

Exhibit 4-1
Annual Revenue Passenger Enplanements
1999-2016



Source: FAA Aerospace Forecasts Fiscal Years 2005-2016

In fiscal year 2004, the U.S. commercial aviation industry, consisting of mainline air carriers and regional/commuter airlines, flew a combined 953.6 billion available seat-miles (ASMs, the number of available seats multiplied by the number of miles each seat was flown). These carriers enplaned 688.5 million passengers who flew 717.4 billion revenue passenger-miles, (RPMs, the number of total miles flown by all paying

passengers), achieving an all-time high load factor of 75.2 percent. In 2004, the carriers' trip length averaged 1,042.1 miles while their aircraft averaged 135.4 seats.

By 2016, the FAA forecasts that U.S. commercial air carriers will fly a total of almost 1.6 trillion ASMs, an annual growth rate of 4.2 percent. These carriers are projected to transport over 1.0 billion enplaned passengers that year (up 3.6 percent annually). Load factors are projected to average 76.3 percent in 2016. The average passenger trip length is expected to increase to 1,139.4 miles (up 8.1 miles annually) while aircraft size increases to 139.6 seats (up 0.4 seats a year).

FORECAST APPROACH AND CONSIDERATIONS

Demand projections fall into two distinct categories, general aviation and commercial service. Significant differences in these two sectors of the aviation industry often make it necessary to modify the general approach or methodology used in forecasting to reflect the availability of data or airport or industry conditions. The general approach often used to develop aviation forecasts is to identify historic relationships between state-specific aviation elements and U.S. aviation activity. Actual trends in demand experienced on an airport, state, regional, and national basis are also considered.

GENERAL AVIATION CONSIDERATIONS

For the Vermont Airport System Plan, reliable historical general aviation data for each airport in the system is not readily available for all activity indicators. As a result, each airport's most recent FAA 5010 Airport Master Record serves as the basis of data for based aircraft and the number of operations at each airport, which were summarized in Chapter Two. It should be noted that military based aircraft and operations will not be counted or used in the forecasts for general aviation based aircraft and operations. Burlington International Airport is the only study airport that has based military aircraft, with a total of 28. Several of the study airports had military operations occur in 2005.

There were a total of 583 general aviation based aircraft reported in Vermont in 2005, as depicted in **Table 4-5**. Of the total number of based aircraft, 72 percent are based at publicly owned airports, with the remaining 28 percent located at privately owned airports.

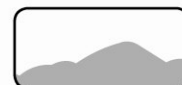
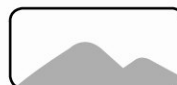


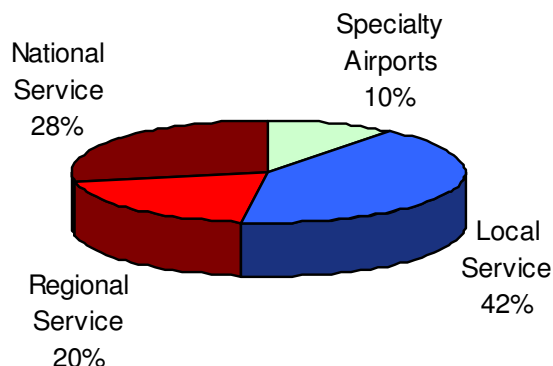
Table 4-5
2005 Based Aircraft in Vermont

Airport Name	City	2005 Based Aircraft
Basin Harbor	Vergennes	0
Burlington International	Burlington	63
Caledonia County State	Lyndonville	19
Edward F. Knapp State	Barre/Montpelier	60
Fair Haven Municipal	Fair Haven	2
Franklin County State	Highgate	53
Hartness State	Springfield	37
John H. Boylan State	Island Pond	1
Middlebury State	Middlebury	50
Morrisville-Stowe State	Morrisville	28
Mount Snow	West Dover	7
Newport State	Newport	17
Post Mills	Post Mills	29
Rutland State	Rutland	41
Shelburne	Shelburne	56
Warren-Sugarbush	Warren	70
William H. Morse	Bennington	50
All Vermont Airports		583

Source: FAA 5010 Airport Master Record

In Chapter Three, each public-use airport in Vermont was stratified into one of four different roles based upon its activity and facilities, and how each contributes to the State system. **Exhibit 4-2** presents the percentages of based aircraft for each of the roles for 2005. Local Service airports have the most based aircraft in Vermont, with 42 percent of the statewide aircraft. National Service airports have the second greatest share of statewide based aircraft, with 28 percent. The three airports classified as Regional Service contain 20 percent, with the remaining 10 percent located at the Specialty Airports.

Exhibit 4-2
2005 Vermont Based Aircraft by Role



Source: Airport Management; Wilbur Smith Associates

General aviation operations data for Vermont airports are presented in **Table 4-6**. Approximately 84 percent of all statewide general aviation operations occurred at Vermont's publicly owned airports in 2005. The remaining 16 percent of general aviation operations occurred at privately owned airports throughout the State.

Table 4-6
2005 General Aviation Operations

Airport Name	City	2005 Aircraft Operations
Basin Harbor	Vergennes	2,000
Burlington International	Burlington	53,312
Caledonia County State	Lyndonville	2,050
Edward F. Knapp State	Barre/Montpelier	31,000
Fair Haven Municipal	Fair Haven	400
Franklin County State	Highgate	19,900
Hartness State	Springfield	9,200
John H. Boylan State	Island Pond	200
Middlebury State	Middlebury	31,450
Morrisville-Stowe State	Morrisville	17,520
Mount Snow	West Dover	6,600
Newport State	Newport	6,960
Post Mills	Post Mills	9,510
Rutland State	Rutland	26,936
Shelburne	Shelburne	3,000
Warren-Sugarbush	Warren	22,500
William H. Morse	Bennington	26,400
All Vermont Airports		268,938

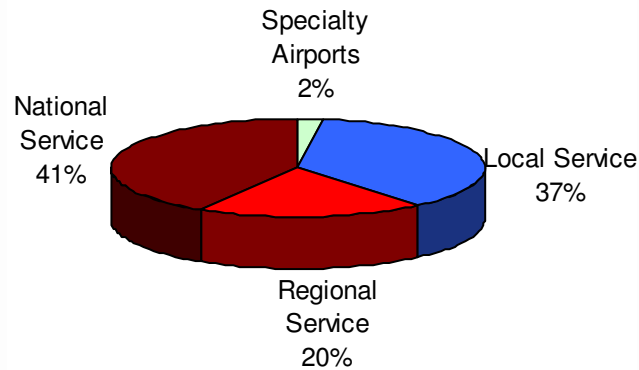
Source: FAA 5010 Airport Master Record

As shown in **Exhibit 4-3**, in 2005, 41 percent of statewide general aviation operations occurred at National Service airports. Local Service airports in Vermont facilitate the next highest amount of general aviation operations with 37 percent.

Vermont Airport System and Policy Plan

Regional Service Airports handled approximately 20 percent of all general aviation operations, with the remaining two percent occurring at the Specialty Airports.

Exhibit 4-3
2005 General Aviation Operations by Role



Source:

5010 Master Record, Wilbur Smith Associates

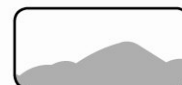
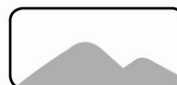
COMMERCIAL SERVICE CONSIDERATIONS

Two of Vermont's public-use airports provide commercial service, Burlington International and Rutland State. Burlington International has historically been the primary provider of commercial service of the Vermont system airports. In 2004, Burlington International enplaned approximately 1.2 million passengers, more than 99 percent of the total enplanements made in Vermont. Burlington International also had more than 94 percent of the total commercial operations in 2004. Rutland State provides several flights a day to connecting hubs in the New England region.

GENERAL AVIATION PROJECTIONS

General aviation activity represents all facets of civil aviation, except activity by certificated air carriers. Projections of based aircraft, fleet mix, and general aviation operations were prepared for the system airports in the State of Vermont. These terms are defined as follows:

- Based aircraft - The total number of active general aviation aircraft that are either hangared or tied down at the airport.
- Fleet mix - The type of aircraft that operate or are based at an airport (i.e. single-engine, multi-engine, jet, etc.).



- Operations - An operation is defined as a landing or a takeoff; both a landing and a takeoff, such as a touch-and-go, account for two operations.

BASED AIRCRAFT PROJECTIONS

Four methodologies were explored as possible tools to project based aircraft at each system airport. The first methodology used to project based aircraft was a top down methodology. This methodology projected statewide based aircraft using a market share approach. The second methodology used a socioeconomic approach based on projected county population growth. The third methodology also used a socioeconomic approach based on county employment estimates. The last methodology involved applying various growth rates to the based aircraft in each role, based upon FAA projections of the future nationwide general aviation fleet mix. Each of these methodologies, their resultant projections, and the preferred based aircraft projections are discussed in the following sections.

Market Share Methodology: Share of U.S. Total Active General Aviation Aircraft

The first methodology used to project based aircraft was a top down approach. For this methodology, Vermont's share of total U.S. active general aviation aircraft in 2005 was assumed to remain constant throughout the forecast period. Based on this assumption and using the *FAA Aerospace Forecasts Fiscal Years 2005-2016* national forecast of active general aviation aircraft, a statewide projection of based aircraft for Vermont was developed and is presented in **Table 4-7**. Using this approach, statewide based aircraft are projected to increase from 583 in 2005 to 672 in 2025, an average annual growth rate of 0.71 percent. By applying each airport's share of statewide based aircraft in 2005 to the projection of statewide based aircraft over the planning period, individual airport projections were produced as presented in **Table 4-8**.

Table 4-7
Projections of Statewide Based Aircraft
U.S. Market Share Methodology

	2005	%	2010	2015	2025
FAA U.S. Active Aircraft Fleet	219,780	100%	230,335	238,645	253,284
Vermont	583	0.27%	611	633	672

Source: *FAA Aerospace Forecasts Fiscal Years 2005-2016*, Wilbur Smith Associates

Table 4-8
Projections of Based Aircraft
Vermont Market Share Methodology

Airport Name	City	2005 Based Aircraft	Airport % Of VT Total	Projected Based Aircraft		
				2010	2015	2025
Basin Harbor	Vergennes	0	0.0%	0	0	0
Burlington International	Burlington	63	10.8%	66	68	73
Caledonia County State	Lyndonville	19	3.3%	20	21	22
Edward F. Knapp State	Barre/Montpelier	60	10.3%	63	65	69
Fair Haven Municipal	Fair Haven	2	0.3%	2	2	2
Franklin County State	Highgate	53	9.1%	56	58	61
Hartness State	Springfield	37	6.3%	39	40	43
John H. Boylan State	Island Pond	1	0.2%	1	1	1
Middlebury State	Middlebury	50	8.6%	52	54	58
Morrisville-Stowe State	Morrisville	28	4.8%	29	30	32
Mount Snow	West Dover	7	1.2%	7	8	8
Newport State	Newport	17	2.9%	18	18	20
Post Mills	Post Mills	29	5.0%	30	31	33
Rutland State	Rutland	41	7.0%	43	45	47
Shelburne	Shelburne	56	9.6%	59	61	65
Warren-Sugarbush	Warren	70	12.0%	73	76	81
William H. Morse	Bennington	50	8.6%	52	54	58
All Airports		583	100.0%	611	633	672

Source: Wilbur Smith Associates

Socioeconomic Methodology: County Population Projections

The second methodology used to project based aircraft used Vermont's projected population growth. Population projections on a state and county level were developed for Vermont by MISER. From these projections, a ratio of population per based aircraft was calculated for each county in Vermont. This methodology assumes that each county's ratio will remain the same over the forecast period. The MISER report projects population through 2020. A population projection for 2025 was extrapolated from the growth implied in the projections prepared by MISER between 2015 and 2020. The projected county-specific based aircraft were then applied to the airports located in each county. This was accomplished using each airport's current share of the county's based aircraft.

The results of this methodology are presented in **Table 4-9**. Statewide based aircraft are projected to reach 639 by 2025, up from a current level of 583. This represents an average annual growth of 0.46 percent.

Socioeconomic Methodology: County Employment Projections

The third methodology examined to project based aircraft applied the same approach as described above, however, the ratio of employment per based aircraft was used instead of population per based aircraft. The projected county based aircraft were applied to the airports located in each county, using each airport's current share of the county's based aircraft. The results of this methodology are presented in **Table 4-10**. As shown, using this methodology, statewide based aircraft are projected to increase from 583 to 722 in 2025, an average annual growth rate of 1.1 percent.

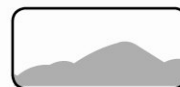
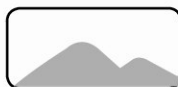


Table 4-9
Projections of Based Aircraft
Projected Statewide Population Growth Methodology

County	Airport Name	2005*	Population Projections			2025 Extrapolated	2005 BA	Pop. Per BA	Projected Based Aircraft		
City			2010	2015	2020				2010	2015	2025
Addison County		37,052	37,907	38,805	39,813	40,848	50	741	52	53	56
Vergennes	Basin Harbor	0						0	0	0	
Middlebury	Middlebury State	50						50	53	56	
Bennington County		37,295	37,420	37,530	37,694	37,860	50	746	51	51	51
Bennington	William H. Morse	50						51	51	51	
Caledonia County		30,455	31,121	31,816	32,550	33,301	19	1,603	20	20	21
Lyndonville	Caledonia County State	19						20	20	21	
Chittenden County		152,846	157,471	161,491	165,813	170,250	119	1,284	123	126	133
Burlington	Burlington International	63						65	67	70	
Shelburne	Shelburne	56						58	59	63	
Essex County		6,603	6,711	6,848	6,981	7,116	1	6,603	2	2	2
Island Pond	John H. Boylan State	1						2	2	2	
Franklin County		47,617	49,583	51,701	54,065	56,537	53	898	56	58	63
Highgate	Franklin County State	53						56	58	63	
Lamoille County		24,442	25,601	26,756	27,898	29,088	28	843	30	31	34
Morrisville	Morrisville-Stowe State	28						31	32	35	
Orange County		28,976	29,544	30,122	30,737	31,365	29	999	30	31	32
Post Mills	Post Mills	29						30	31	32	
Orleans County		26,899	27,453	28,009	28,562	29,127	17	1,582	18	18	19
Newport	Newport State	17						18	18	19	
Rutland County		63,936	64,255	64,637	65,030	65,427	43	1,487	44	44	45
Fair Haven	Fair Haven Municipal	2						2	2	2	
Rutland	Rutland State	41						42	42	43	
Washington County		59,141	59,931	60,636	61,322	62,016	130	455	132	134	137
Barre/Montpelier	Edward F. Knapp State	60						61	62	63	
Warren	Warren-Sugarbush	70						71	72	74	
Windham County		45,093	45,769	46,455	47,171	47,899	7	6,442	8	8	8
West Dover	Mount Snow	7						8	8	8	
Windsor County		58,154	58,553	58,960	59,446	59,936	37	1,572	38	38	39
Springfield	Hartness State	37						38	38	39	
Total--All Vermont Airports		618,511	631,319	643,765	657,083	670,677	583	1,061	604	614	639

Source: Massachusetts Institute for Social and Economic Research, Wilbur Smith Associates

Table 4-10
Projections of Based Aircraft
Projected Statewide Employment Growth

County	City	Airport Name	Projected Employment			2005 Based Aircraft	Employment Per BA	Projected Based Aircraft			
			2005*	2010	2015			2025	2010	2015	2025
Addison County			20,550	22,217	24,019	28,075	50	411	55	59	69
	Vergennes	Basin Harbor	0				0	0	0	0	
	Middlebury	Middlebury State	50				55	59	69		
Bennington County			19,900	20,875	21,899	24,098	50	398	53	56	61
	Bennington	William H. Morse	50				53	56	61		
Caledonia County			16,800	17,827	18,918	21,303	19	884	21	22	25
	Lyndonville	Caledonia County State	19				21	22	25		
Chittenden County			86,300	91,325	96,642	108,223	119	725	126	134	150
	Burlington	Burlington International	63				67	71	79		
	Shelburne	Shelburne	56				59	63	71		
Essex County			3,350	3,403	3,458	3,569	1	3,350	2	2	2
	Island Pond	John H. Boylan State	1				2	2	2		
Franklin County			25,100	26,459	27,891	30,992	53	474	56	59	66
	Highgate	Franklin County State	53				56	59	66		
Lamoille County			14,900	15,876	16,916	19,204	29	514	30	32	37
	Morrisville	Morrisville-Stowe State	29				31	33	38		
Orange County			16,000	16,863	17,772	19,740	29	552	31	33	36
	Post Mills	Post Mills	29				31	33	36		
Orleans County			14,600	15,359	16,158	17,883	17	859	18	19	21
	Newport	Newport State	17				18	19	21		
Rutland County			34,550	35,431	36,334	38,211	43	803	45	46	48
	Fair Haven	Fair Haven Municipal	2				2	2	2		
	Rutland	Rutland State	41				43	44	46		
Washington County			30,900	32,089	33,324	35,938	130	238	136	141	152
	Barre/Montpelier	Edward F. Knapp State	60				63	65	70		
	Warren	Warren-Sugarbush	70				73	76	82		
Windham County			25,150	26,344	27,595	30,278	7	3,593	8	8	9
	West Dover	Mount Snow	7				8	8	9		
Windsor County			32,100	33,790	35,569	39,413	37	868	39	41	46
	Springfield	Hartness State	37				39	41	46		
Total--All Vermont Airports			340,200	357,859	376,495	416,927	583	584	620	652	722

Source: Wilbur Smith Associates

FAA Forecasted General Aviation Fleet Methodology: Airport Roles

The final methodology for projecting based aircraft used a bottom-up approach. For this methodology, a compound annual growth rate was calculated for each of the four roles, as determined in Chapter Three. This methodology involved several steps utilizing the *FAA Aerospace Forecasts, Fiscal Years 2005-2016*, which provides growth rates for various categories of aircraft. The FAA average annual growth rates for the aircraft categories are:

- Single-Engine – 0.24 percent
- Multiengine (Piston and Turbine) – 0.24 percent
- Turbo Jet – 5.58 percent
- Rotorcraft – 1.14 percent
- Experimental/Sport/Gliders – 1.85 percent

For each of the roles, based aircraft in each of the five categories were summed. A percentage of the total based aircraft in each role was then calculated for each of the five categories. This percentage was then multiplied by the corresponding FAA growth rate for the specified category to create a weighted growth rate for each category. The weighted percentages were then summed for each role. This total represents each role's CAGR, which was then applied to the based aircraft at each of the airports in that role. Statewide based aircraft are projected using this methodology to reach 668 by 2025, as depicted in Table 4-11, an increase of 85 over the 20-year period. This represents an average annual growth of 0.68 percent.

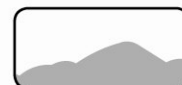
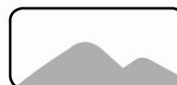


Table 4-11
Projections of Based Aircraft
Airport Roles

Aircraft Type		Single-Engine	Multien-gine	Jet	Helicopter	Experimental /Sport/Other	2005 Based Aircraft	CAGR	2010	2015	2025
FAA Growth Rate 05'-16'		0.24%	0.24%	5.58%	1.14%	1.85%					
Airport Name	City										
Specialty Airports								0.43%			
Basin Harbor	Vergennes	0	0	0	0	0	0		0	0	0
John H. Boylan State	Island Pond	0	0	0	0	1	1		2	2	2
Fair Haven Municipal	Fair Haven	2	0	0	0	0	2		3	3	3
Shelburne	Shelburne	50	0	0	0	6	56		58	59	62
	Total	52	0	0	0	7	59		63	64	67
	% of all Aircraft	88%	0%	0%	0%	12%					
	Weighted %	0.21%	0.00%	0.00%	0.00%	0.22%					
Local Service								0.73%			
Mount Snow	West Dover	5	2	0	0	0	7		8	8	9
Newport State	Newport	15	2	0	0	0	17		18	19	20
Caledonia County State	Lyndonville	19	0	0	0	0	19		20	21	23
Post Mills	Post Mills	20	0	0	0	9	29		31	32	34
Middlebury State	Middlebury	42	3	3	0	2	50		52	54	58
Franklin County State	Highgate	46	1	0	1	5	53		55	58	62
Warren-Sugarbush	Warren	20	0	0	0	50	70		73	76	82
	Total	167	8	3	1	66	245		257	268	288
	% of all Aircraft	68%	3%	1%	0%	27%					
	Weighted %	0.16%	0.01%	0.07%	0.00%	0.50%					
Regional Service								0.55%			
Morrisville-Stowe State	Morrisville	18	2	0	0	8	28		29	30	32
Hartness S	Springfield	28	1	0	0	8	37		39	40	42
William H. Morse	Bennington	24	18	0	2	6	50		52	53	56
	Total	70	21	0	2	22	115		120	123	130
	% of all Aircraft	61%	18%	0%	2%	19%					
	Weighted %	0.15%	0.04%	0.00%	0.02%	0.35%					

Table 4-11
Projections of Based Aircraft
Airport Roles, Continued

Aircraft Type		Single-Engine	Multien-gine	Jet	Helicopter	Experimental /Sport/Other	2005 Based Aircraft	CAGR	2010	2015	2025
FAA Growth Rate 05'-16'		0.24%	0.24%	5.58%	1.14%	1.85%					
National Service								0.49%			
Rutland State	Rutland	33	3	2	2	1	41		43	44	46
Edward F. Knapp State	Barre/Montpelier	55	5	0	0	0	60		62	64	67
Burlington International	Burlington	48	9	5	1	0	63		65	67	70
	Total	136	17	7	3	1	164		170	175	183
	% of all Aircraft	83%	10%	4%	2%	1%					
	Weighted %	0.20%	0.02%	0.24%	0.02%	0.01%					
All Airports							583		610	630	668

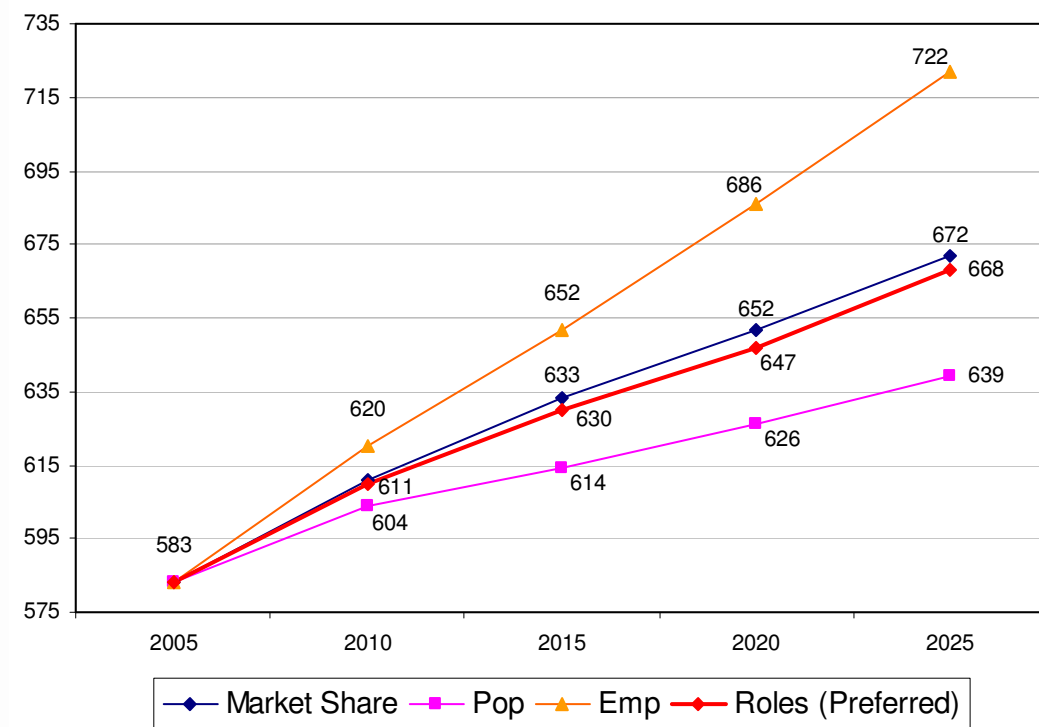
Source: Wilbur Smith Associates

Vermont Airport System and Policy Plan

PREFERRED BASED AIRCRAFT PROJECTIONS

The results from the four based aircraft projection methodologies in the system plan were compared for each airport. **Exhibit 4-4** graphically presents the results of the four methodologies and how they compare to one another. For this study, the airport roles method was selected as the preferred approach for forecasting based aircraft. **Table 4-12** presents each airport's preferred based aircraft projection throughout the planning period. This methodology produced a 2025 projection of 668 based aircraft. This represents an average annual growth rate of 0.68 percent.

Exhibit 4-4
Projections of Based Aircraft at Vermont System Airports



Source: Wilbur Smith Associates

Table 4-12
Preferred Based Aircraft Projections

Airport Name	City	2005 Based Aircraft	2010	2015	2025
Basin Harbor	Vergennes	0	0	0	0
Burlington International	Burlington	63	65	67	70
Caledonia County State	Lyndonville	19	20	21	23
Edward F. Knapp State	Barre/Montpelier	60	62	64	67
Fair Haven Municipal	Fair Haven	2	3	3	3
Franklin County State	Highgate	53	55	58	62
Hartness State	Springfield	37	39	40	42
John H. Boylan State	Island Pond	1	2	2	2
Middlebury State	Middlebury	50	52	54	58
Morrisville-Stowe State	Morrisville	28	29	30	32
Mount Snow	West Dover	7	8	8	9
Newport State	Newport	17	18	19	20
Post Mills	Post Mills	29	31	32	34
Rutland State	Rutland	41	43	44	46
Shelburne	Shelburne	56	58	59	62
Warren-Sugarbush	Warren	70	73	76	82
William H. Morse	Bennington	50	52	53	56
All Vermont Airports		583	610	630	668

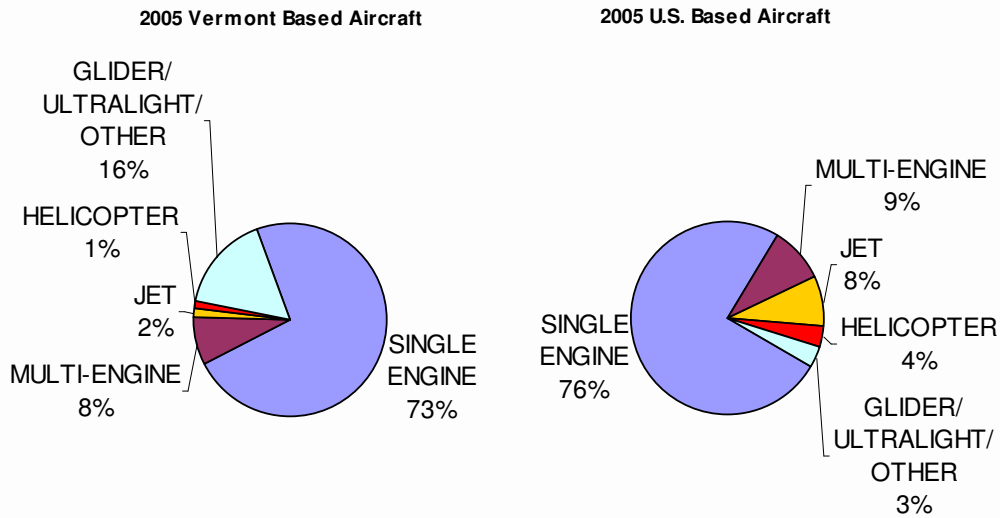
Source: Wilbur Smith Associates

BASED AIRCRAFT FLEET MIX

In projecting the statewide based aircraft fleet mix for Vermont, consideration was given to the continually changing national active general aviation aircraft fleet and the existing fleet mix in the State. **Exhibit 4-5** presents the based aircraft fleet mix for Vermont and the active general aviation aircraft fleet in the U.S. In 2005, single-engine aircraft accounted for 73 percent of the based aircraft fleet at all public-use airports in Vermont, comparable to single-engine aircraft comprising 76 percent of the total U.S. fleet. The percentage of gliders, ultra-lights, and other sport aviation aircraft based in Vermont is much higher than the three percent in the active U.S. fleet, totaling 16 percent. The share of multiengine, jet, helicopter and other aircraft of the total active fleet was higher than the share at Vermont airports.



Exhibit 4-5 Comparison of 2005 Vermont and U.S. Based Aircraft by Type



Sources: Wilbur Smith Associates; *FAA Aerospace Forecasts Fiscal Years 2005-2016*

The FAA asserts in the *FAA Aerospace Forecasts FY 2005-2016* that there will be strong growth in active general aviation jet aircraft during the forecast period. This trend illustrates a movement in the general aviation community toward more sophisticated, higher performing, and more demanding aircraft. This trend will impact the types of activity occurring at general aviation airports and the types of facilities required at those airports. The FAA projects that the percentage increase in jet aircraft will significantly outpace growth in other components of the aircraft fleet. Single-engine aircraft are projected to experience an average annual growth rate of 0.2 percent per year over the forecast period, while the total number of multi-engine piston aircraft is projected to decline at an average annual growth rate of 0.2 percent.

For this analysis, statewide based aircraft fleet mix was projected for 2010, 2015, and 2025. **Tables 4-13, 4-14, and 4-15** present the based aircraft fleet mix for Vermont for these years respectively. It is projected that single-engine aircraft, which comprise 73 percent of all based aircraft in the State, will decline over the next 20 years to 69 percent by 2025. Jet aircraft are projected to experience an increase of 2 percent by 2025, and will comprise 4 percent of Vermont's total based aircraft in 2025. Experimental and sport aircraft are projected to increase from 96 for 2005 to 130 in 2025, and will comprise 19 percent of Vermont's based aircraft. **Table 4-16** presents the total number of aircraft types for the whole State by milestone projection year.

Table 4-13
2010 Projections of Based Aircraft Fleet Mix

Airport Name	City	Single Engine	Multi-Engine	Jet	Helicopter	Experimental/Sport/Other	Total
Basin Harbor	Vergennes	0	0	0	0	0	0
Burlington International	Burlington	49	9	6	1	0	65
Caledonia County State	Lyndonville	20	0	0	0	0	20
Edward F. Knapp State	Barre/Montpelier	56	5	1	0	0	62
Fair Haven Municipal	Fair Haven	3	0	0	0	0	3
Franklin County State	Highgate	47	1	0	1	6	55
Hartness State	Springfield	29	1		0	9	39
John H. Boylan State	Island Pond	1	0	0	0	1	2
Middlebury State	Middlebury	43	3	3	0	3	52
Morrisville-Stowe State	Morrisville	19	2	0	0	8	29
Mount Snow	West Dover	6	2	0	0	0	8
Newport State	Newport	16	2	0	0	0	18
Post Mills	Post Mills	21	0	0	0	10	31
Rutland State	Rutland	34	3	3	2	1	43
Shelburne	Shelburne	51	0	0	0	7	58
Warren-Sugarbush	Warren	21	0	0	0	52	73
William H. Morse	Bennington	25	18	0	2	7	52
All Airports		441	46	13	6	104	610

Source: Wilbur Smith Associates

Table 4-14
2015 Projections of Based Aircraft Fleet Mix

Airport Name	City	Single Engine	Multi-Engine	Jet	Helicopter	Experimental/Sport/Other	Total
Basin Harbor	Vergennes	0	0	0	0	0	0
Burlington International	Burlington	50	9	7	1	0	67
Caledonia County State	Lyndonville	20	0	0	0	1	21
Edward F. Knapp State	Barre/Montpelier	57	6	1	0	0	64
Fair Haven Municipal	Fair Haven	3	0	0	0	0	3
Franklin County State	Highgate	47	1	0	1	9	58
Hartness State	Springfield	30	1		0	9	40
John H. Boylan State	Island Pond	1	0	0	0	1	2
Middlebury State	Middlebury	44	3	3	0	4	54
Morrisville-Stowe State	Morrisville	19	2	0	0	9	30
Mount Snow	West Dover	6	2	0	0	0	8
Newport State	Newport	17	2	0	0	0	19
Post Mills	Post Mills	21	0	0	0	11	32
Rutland State	Rutland	34	3	4	2	1	44
Shelburne	Shelburne	51	0	0	0	8	59
Warren-Sugarbush	Warren	21	0	0	0	55	76
William H. Morse	Bennington	26	18	0	2	7	53
All Airports		447	47	15	6	115	630

Sources: Wilbur Smith Associates

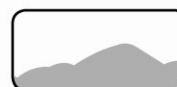


Table 4-15
2025 Projections of Based Aircraft Fleet Mix

Airport Name	City	Single Engine	Multi-Engine	Jet	Helicopter	Experimental/Sport/Other	Total
Basin Harbor	Vergennes	0	0	0	0	0	0
Burlington International	Burlington	50	9	9	2	0	70
Caledonia County State	Lyndonville	21	0	0	0	2	23
Edward F. Knapp State	Barre/Montpelier	58	6	3	0	0	67
Fair Haven Municipal	Fair Haven	3	0	0	0	0	3
Franklin County State	Highgate	49	2	0	1	10	62
Hartness State	Springfield	30	1	2	0	9	42
John H. Boylan State	Island Pond	1	0	0	0	1	2
Middlebury State	Middlebury	46	3	3	0	6	58
Morrisville-Stowe State	Morrisville	20	2	0	0	10	32
Mount Snow	West Dover	7	2	0	0	0	9
Newport State	Newport	17	2	1	0	0	20
Post Mills	Post Mills	22	0	0	0	12	34
Rutland State	Rutland	34	3	6	2	1	46
Shelburne	Shelburne	51	0	0	0	11	62
Warren-Sugarbush	Warren	23	0	0	0	59	82
William H. Morse	Bennington	26	18	1	2	9	56
All Airports		458	48	25	7	130	668

Source: Wilbur Smith Associates

Table 4-16
Vermont Preferred Based Aircraft Fleet Mix Projection

Year	Single Engine	%	Multi-Engine	%	Jet	%	Helicopter	%	Experimental/Sport/Other	%	Total
2005	425	73%	46	8%	10	2%	6	1%	96	16%	583
2010	441	72%	46	8%	13	2%	6	1%	104	17%	610
2015	447	71%	47	7%	15	2%	6	1%	115	18%	630
2025	458	69%	48	7%	25	4%	7	1%	130	19%	668

Source: Wilbur Smith Associates

GENERAL AVIATION OPERATIONS PROJECTIONS

The projection of operational demand at an airport determines the need for airside improvements. Total annual operational demand can consist of several types of activity including air carrier, military, air taxi, and general aviation. For those airports with scheduled commercial air service, air carrier activity is projected separately in a subsequent section. For those airports with annual military operations, the military operations were subtracted from the total operational estimate, as were commercial operations, to arrive at a total annual general aviation activity level for each system airport. Air taxi operations are included in the general aviation operations projections.



Due to the inherent limitations in the historic data for general aviation operations data as discussed previously, it was not possible to develop projections based on historical general aviation operational growth. Three methodologies were investigated to project general aviation operations for 2010, 2015, and 2025. These methodologies include an operations per based aircraft (OPBA) methodology, a socioeconomic methodology using population projections, and a socioeconomic methodology using employment projections. These three methodologies are discussed in detail in the following sections. It is important to note that due to the estimates of operational activity, all projections are rounded to the nearest hundred.

Operations Per Based Aircraft (OPBA)

The first methodology, the OPBA methodology, uses each airport's preferred projected number of based aircraft and multiplies the number by the 2005 OPBA ratio to yield projected total annual general aviation aircraft operations. The preferred based aircraft projections (Table 4-12) previously presented were used for this projection technique. Statewide, an OPBA of 461 was the average, with the highest OPBA at Mount Snow, with 943. Shelburne had the lowest OPBA with 54, after Basin Harbor which has no based aircraft resulting in an OPBA of zero. It should be noted, that as a result of Basin Harbor having no based aircraft, its operations are projected to remain constant throughout the planning period. Each airport's 2005 OPBA was held constant throughout the planning period to develop projections of annual operations. **Table 4-17** presents the results of this methodology.

As shown, current statewide general aviation operations are estimated at 268,938. The OPBA methodology produced a projection of nearly 306,800 general aviation operations by 2025. Using the OPBA methodology, statewide annual general aviation operations are projected to grow at an average annual rate of 0.66 percent over the planning period.

Socioeconomic Methodology: County Population Projections

The second methodology used the same approach as forecasting based aircraft using projected statewide population. A ratio of operations to population was developed for each county for 2005. This ratio was applied to projected population to produce projections of general aviation operations by county. As shown in **Table 4-18**, each airport was assigned a portion of these projected operations based on its current reported share of total county general aviation operations. Using this methodology, statewide general aviation operations are projected to reach nearly 291,600 by 2025, up 0.41 percent per year on average.



Socioeconomic Methodology: County Employment Projections

The third methodology used the same approach above to forecast future operations, but used projected statewide employment. A ratio of operations to employment was developed for each county for 2005. This ratio was applied to projected employment to produce projections of general aviation operations by county. As shown in **Table 4-19**, each airport was assigned a portion of these projected operations based on its current reported share of total county general aviation operations. Using this methodology, statewide general aviation operations are projected to reach nearly 330,100 by 2025, up 1.0 percent per year on average.



Table 4-17
Projections of Operations
OPBA Methodology

Airport Name	City	Based Aircraft	2005 Operations	2005 OPBA	Preferred Projected Based Aircraft			Projected Operations		
					2010	2015	2025	2010	2015	2025
Basin Harbor	Vergennes	0	2,000	0	0	0	0	2,000	2,000	2,000
Burlington International	Burlington	63	53,312	846	65	67	70	55,000	56,700	59,200
Caledonia County State	Lyndonville	19	2,050	108	20	21	23	2,200	2,300	2,500
Edward F. Knapp State	Barre/Montpelier	60	31,000	517	62	64	67	32,000	33,100	34,600
Fair Haven Municipal	Fair Haven	2	400	200	3	3	3	600	600	600
Franklin County State	Highgate	53	19,900	375	55	58	62	20,700	21,800	23,300
Hartness State	Springfield	37	9,200	249	39	40	42	9,700	9,900	10,400
John H. Boylan State	Island Pond	1	200	200	2	2	2	400	400	400
Middlebury State	Middlebury	50	31,450	629	52	54	58	32,700	34,000	36,500
Morrisville-Stowe State	Morrisville	28	17,520	626	29	30	32	18,100	18,800	20,000
Mount Snow	West Dover	7	6,600	943	8	8	9	7,500	7,500	8,500
Newport State	Newport	17	6,960	409	18	19	20	7,400	7,800	8,200
Post Mills	Post Mills	29	9,510	328	31	32	34	10,200	10,500	11,100
Rutland State	Rutland	41	26,936	657	43	44	46	28,200	28,900	30,200
Shelburne	Shelburne	56	3,000	54	58	59	62	3,100	3,200	3,300
Warren-Sugarbush	Warren	70	22,500	321	73	76	82	23,500	24,400	26,400
William H. Morse	Bennington	50	26,400	528	52	53	56	27,500	28,000	29,600
All Airports		583	268,938	461	610	630	668	280,800	289,900	306,800

Source: Wilbur Smith Associates

Table 4-18
Projections of Operations
Population Growth Methodology

County		Projected Population				2005 Operations	Pop. Per Ops.	Market Share	2010	2015	2025
City	Airport Name	2005*	2010	2015	2025						
Addison County		37,052	37,907	38,805	40,848	33,450	1.11		34,200	35,000	36,900
Vergennes	Basin Harbor					2,000		0.06	2,045	2,093	2,206
Middlebury	Middlebury State					31,450		0.94	32,155	32,907	34,694
Bennington County		37,295	37,420	37,530	37,860	26,400	1.41		26,500	26,600	26,800
Bennington	William H. Morse					26,400			27,700	29,100	32,000
Caledonia County		30,455	31,121	31,816	33,301	2,050	14.86		2,100	2,100	2,200
Lyndonville	Caledonia County State					2,050			2,200	2,400	2,600
Chittenden County		152,846	157,471	161,491	170,250	56,312	2.71		58,000	59,500	62,700
Burlington	Burlington International					53,312		0.95	54,910	56,330	59,360
Shelburne	Shelburne					3,000		0.05	3,090	3,170	3,340
Essex County		6,603	6,711	6,848	7,116	200	33.02		200	200	200
Island Pond	John H. Boylan State					200			300	300	300
Franklin County		47,617	49,583	51,701	56,537	19,900	2.39		20,700	21,600	23,600
Highgate	Franklin County State					19,900			21,000	22,200	24,600
Lamoille County		24,442	25,601	26,756	29,088	17,520	1.40		18,400	19,200	20,800
Morrisville	Morrisville-Stowe State					17,520			18,700	19,900	22,600
Orange County		28,976	29,544	30,122	31,365	9,510	3.05		9,700	9,900	10,300
Post Mills	Post Mills					9,510			10,100	10,600	11,800
Orleans County		26,899	27,453	28,009	29,127	6,960	3.86		7,100	7,200	7,500
Newport	Newport State					6,960			7,400	7,800	8,600
Rutland County		63,936	64,255	64,637	65,427	27,336	2.34		27,500	27,600	28,000
Fair Haven	Fair Haven Municipal					400		0.01	402	404	410
Rutland	Rutland State					26,936		0.99	27,098	27,196	27,590
Washington County		59,141	59,931	60,636	62,016	53,500	1.11		54,200	54,900	56,100
Barre/Montpelier	Edward F. Knapp State					31,000		0.58	31,406	31,811	32,507
Warren	Warren-Sugarbush					22,500		0.42	22,794	23,089	23,593
Windham County		45,093	45,769	46,455	47,899	6,600	6.61		6,673	6,769	6,963
West Dover	Mount Snow					6,600			6,673	6,769	6,963

Table 4-18
Projections of Operations
Population Growth Methodology, Continued

County		Projected Population				2005 Operations	Pop. Per Ops.	Market Share	2010	2015	2025
City	Airport Name	2005*	2010	2015	2025						
Windsor County		58,154	58,553	58,960	59,936	9,200	6.83		9,300	9,300	9,500
Springfield	Hartness State	9,200							9,700	10,200	11,300
All Vermont Airports		618,511	631,319	643,765	670,677	268,938			274,600	279,900	291,600

Source: Massachusetts Institute for Social and Economic Research, Wilbur Smith Associates

Table 4-19
Projections of Operations
Employment Growth Methodology

County	Airport Name	2005*	Projected Employment			2005 Operations	Emp. Per Ops.	Market Share	Projected Operations		
			2010	2015	2025				2010	2015	2025
Addison County		20,550	22,217	24,019	28,075	33,450	0.61		36,200	39,100	45,700
Vergennes	Basin Harbor					2,000		0.06	2,164	2,338	2,732
Middlebury	Middlebury State					31,450		0.94	34,036	36,762	42,968
Bennington County		19,900	20,875	21,899	24,098	26,400	0.75		27,700	29,100	32,000
Bennington	William H. Morse					26,400			27,700	29,100	32,000
Caledonia County		16,800	17,827	18,918	21,303	2,050	8.20		2,200	2,300	2,600
Lyndonville	Caledonia County State					2,050			2,200	2,400	2,600
Chittenden County		86,300	91,325	96,642	108,223	56,312	1.53		59,600	63,100	70,600
Burlington	Burlington International					53,312		0.95	56,425	59,738	66,839
Shelburne	Shelburne					3,000		0.05	3,175	3,362	3,761
Essex County		3,350	3,403	3,458	3,569	200	16.75		200	200	200
Island Pond	John H. Boylan State					200			300	300	300
Franklin County		25,100	26,459	27,891	30,992	19,900	1.26		21,000	22,100	24,600
Highgate	Franklin County State					19,900			21,000	22,200	24,600
Lamoille County		14,900	15,876	16,916	19,204	17,520	0.85		18,700	19,900	22,600
Morrisville	Morrisville-Stowe State					17,520			18,700	19,900	22,600
Orange County		16,000	16,863	17,772	19,740	9,510	1.68		10,000	10,600	11,700
Post Mills	Post Mills					9,510			10,100	10,600	11,800
Orleans County		14,600	15,359	16,158	17,883	6,960	2.10		7,300	7,700	8,500
Newport	Newport State					6,960			7,400	7,800	8,600
Rutland County		34,550	35,431	36,334	38,211	27,336	1.26		28,000	28,700	30,200
Fair Haven	Fair Haven Municipal					400		0.01	410	420	442
Rutland	Rutland State					26,936		0.99	27,590	28,280	29,758

Table 4-19
Projections of Operations
Employment Growth Methodology, Continued

County	Airport Name	2005*	Projected Employment			2005 Operations	Emp. Per Ops.	Market Share	Projected Operations		
			2010	2015	2025				2010	2015	2025
Washington County		30,900	32,089	33,324	35,938	53,500	0.58		55,600	57,700	62,200
Barre/Montpelier	Edward F. Knapp State					31,000		0.58	32,217	33,434	36,041
Warren	Warren-Sugarbush					22,500		0.42	23,383	24,266	26,159
Windham County		25,150	26,344	27,595	30,278	6,600	3.81		6,866	7,253	7,930
West Dover	Mount Snow					6,600			6,866	7,253	7,930
Windsor County		32,100	33,790	35,569	39,413	9,200	3.49		9,700	10,200	11,300
Springfield	Hartness State					9,200			9,700	10,200	11,300
All Vermont Airports		340,200	357,859	376,495	416,927	268,938			283,100	297,900	330,100

Source: *2005 Vermont Department of Labor
 CAGR 05'-25' provided by Woods and Poole 2005

PREFERRED GENERAL AVIATION OPERATIONS PROJECTION METHODOLOGY

Three methodologies were tested to project general aviation operations at system airports. The OPBA was chosen as the preferred methodology for projecting future operations at Vermont system airports. **Exhibit 4-6** graphically presents the three methodologies tested and how the projected operations compare to one another. **Table 4-20** presents each the preferred projected operations for each airport throughout the study period.

Exhibit 4-6
Projections of General Aviation Operations
at Vermont System Airports

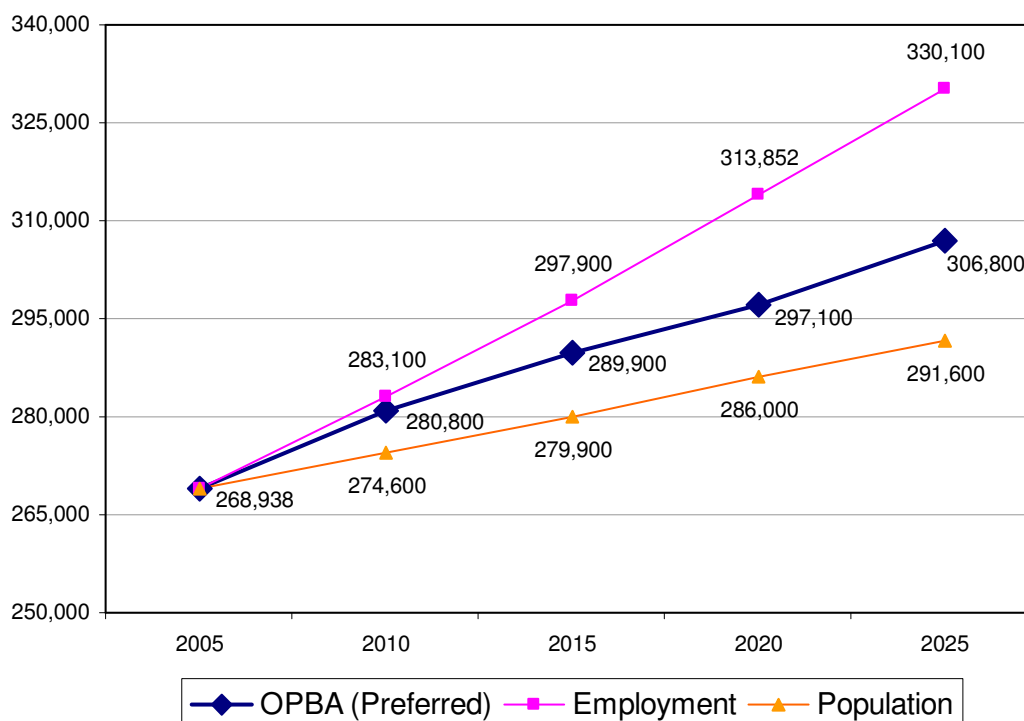


Table 4-20
Preferred General Aviation Operations

Airport Name	City	2005	2010	2015	2025
Basin Harbor	Vergennes	2,000	2,000	2,000	2,000
Burlington International	Burlington	53,312	55,000	56,700	59,200
Caledonia County State	Lyndonville	2,050	2,200	2,300	2,500
Edward F. Knapp State	Barre/Montpelier	31,000	32,000	33,100	34,600
Fair Haven Municipal	Fair Haven	400	600	600	600
Franklin County State	Highgate	19,900	20,700	21,800	23,300
Hartness State	Springfield	9,200	9,700	9,900	10,400
John H. Boylan State	Island Pond	200	400	400	400
Middlebury State	Middlebury	31,450	32,700	34,000	36,500
Morrisville-Stowe State	Morrisville	17,520	18,100	18,800	20,000
Mount Snow	West Dover	6,600	7,500	7,500	8,500
Newport State	Newport	6,960	7,400	7,800	8,200
Post Mills	Post Mills	9,510	10,200	10,500	11,100
Rutland State	Rutland	26,936	28,200	28,900	30,200
Shelburne	Shelburne	3,000	3,100	3,200	3,300
Warren-Sugarbush	Warren	22,500	23,500	24,400	26,400
William H. Morse	Bennington	26,400	27,500	28,000	29,600
All Airports		268,938	280,800	289,900	306,800

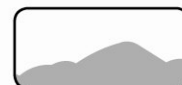
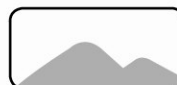
Source: Wilbur Smith Associates

COMMERCIAL SERVICE ACTIVITY PROJECTIONS

Commercial service activity occurs at two of the 17 public-use airports in Vermont; Burlington International and Rutland State Airports. As mentioned in Chapter One, the on-going FAA New England Regional Aviation System Plan (NERASP) provides detailed forecasts of commercial activity at Burlington International Airport. In addition, a Runway Safety Area Study completed in 2005 for Rutland State by URS Corporation provides airport-specific forecasts of commercial activity. As a result, these sources are used to provide forecasts of commercial activity.

BURLINGTON INTERNATIONAL AIRPORT

Burlington International is one of several airports that are included in the NERASP. The NERASP provides forecasts of scheduled service operations and annual enplanements for the year 2020, based on historic data from 2004. Burlington International, considered a New England Hub Airport, had 31,135 scheduled service operations in 2004. Scheduled airline operations are projected to increase at an average annual growth rate of 1.3 percent through 2020, for a total of 38,712. This is lower than the average annual growth rate of 2.1 percent for all New England Hub airports included in the NERASP study. This growth rate was used to interpolate an estimate of commercial operations for the year 2005, and projections for 2010 and



2015. This growth rate was also used to extrapolate the number of operations through 2025. The forecasted number of commercial operations for Burlington International is presented in **Table 4-21**.

Table 4-21
Projected Commercial Operations at Burlington International

Historic	Estimated	Projected		
2004	2005*	2010*	2015*	2025*
31,135	31,562	33,784	36,162	41,433

Note: * Calculated by WSA using NERASP Forecasts for 2020.

Source: New England Regional Aviation System Plan (NERASP)

Burlington International enplaned 1,169,000 passengers in 2004. Enplanements at the airport are expected to increase dramatically through the next five years, at an average annual rate of 6.1 percent to a projected 1,723,000 passengers by 2010. By 2020, it is projected that 2,148,000 enplanements will occur at Burlington, indicating an average annual growth rate of only 2.2 percent between 2010 and 2020, much lower than the first five years of the study period. Enplanements were interpolated for the years 2005 and 2015, and extrapolated for 2025. These projections are presented in **Table 4-22**.

Table 4-22
Projected Enplanements at Burlington International

Historic	Estimated	Projected		
2004	2005*	2010	2015*	2025*
1,169,000	1,240,309	1,723,000	1,921,055	2,394,908

Note: * Calculated by WSA from NERASP forecasts

Source: New England Regional Aviation System Plan (NERASP)

RUTLAND STATE AIRPORT

Commercial activity forecasts were recently completed (2005) as part of a Runway Safety Area Study for Rutland State. The study provides forecasts of commercial operations and enplanements through 2015, using airport-specific criteria to develop forecasts utilizing 2004 as a base year. Rutland State had 1,800 scheduled service operations in 2004, or approximately 900 scheduled flights. Scheduled commercial operations are projected to increase by the year 2010 to 2,800, and remain constant through 2015. These forecasts consider that no changes are made in current service at the airport, and that no new flights are made to any additional hubs besides those at the present. As a result, the 2,800 operations will be held constant throughout the rest of the System Plan's study period. The forecasted number of commercial operations for Rutland State are presented in **Table 4-23**.

Table 4-23
Projected Commercial Operations at Rutland State

Historic	Estimated	Projected		
2004	2005*	2010	2015	2025
1,800	1,938	2,800	2,800	2,800

Note: * Calculated by WSA from Runway Safety Area Study
Source: Rutland State Runway Safety Area Study (URS 2005)

Rutland State Airport enplaned 5,570 passengers in 2004. Passenger traffic increases at Rutland State are assumed to return to those experienced in the 1990s, increasing at an average annual rate of 9.1 percent to a projected 9,440 passengers by 2010. It is projected that by 2015, 13,300 enplanements will occur at Rutland State. As a result of the forecasted operations remaining constant from 2010 to 2015, it has been concluded that the levels of enplanements would also remain constant at approximately 13,300 through 2025. Enplanements were interpolated for the year 2005 by using the average annual growth rate for the years 2004 and 2010. Forecasts of enplanements for Rutland State are presented in **Table 4-24**.

Table 4-24
Projected Enplanements at Rutland State

Historic	Estimated	Projected		
2004	2005	2010	2015	2025
5,570	6,082	9,440	13,300	13,300

Note: * Calculated by WSA from Runway Safety Area Study
Source: Rutland State Runway Safety Area Study (URS 2005)

MILITARY ACTIVITY PROJECTIONS

Table 4-25 presents projected military activity for the airports in Vermont. In 2005, military operations occurred at 10 public-use airports in Vermont. Military activity varies with the political climate and variation in government funding of the military. It is projected that the 2005 level of military operations will remain constant throughout the planning period at each airport.

Table 4-25
Military Operations at Public-Use Airports

Airport Name	City	2005	2010	2015	2025
Basin Harbor	Vergennes	100	100	100	100
Burlington International	Burlington	12,171	12,171	12,171	12,171
Edward F Knapp State	Barre/Montpelier	1,000	1,000	1,000	1,000
Franklin County State	Highgate	1,500	1,500	1,500	1,500
Hartness State	Springfield	100	100	100	100
Middlebury State	Middlebury	800	800	800	800
Morrisville-Stowe State	Morrisville	500	500	500	500
Newport State	Newport	180	180	180	180
Rutland State	Rutland	832	832	832	832
William H. Morse State	Bennington	120	120	120	120

Source: FAA 5010 Airport Master Record

SUMMARY

Table 4-26 presents a summary of the forecasts for the airports in Vermont over the planning period. These projections will be used in the next step of the Vermont Airport System Plan to determine the ability of public airports in the State to meet current and future demand.

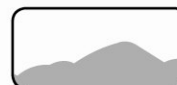
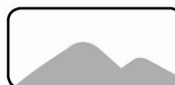


Table 4-26
Projections of Total Operations at Vermont's Public Use Airports

Airport Name	City Year	Based Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
Basin Harbor	Vergennes					
	2005	0	2,000		100	2,100
	2010	0	2,000		100	2,100
	2015	0	2,000		100	2,100
	2025	0	2,000		100	2,100
Burlington International	Burlington					
	2005	63	53,312	31,562	12,171	97,045
	2010	65	55,000	33,784	12,171	101,000
	2015	67	56,700	36,162	12,171	105,000
	2025	70	59,200	41,433	12,171	112,800
Caledonia County State	Lyndonville					
	2005	19	2,050			2,050
	2010	20	2,200			2,200
	2015	21	2,300			2,300
	2025	23	2,500			2,500
Edward F. Knapp State	Barre/Montpelier					
	2005	60	31,000		1,000	32,000
	2010	62	32,000		1,000	33,000
	2015	64	33,100		1,000	34,100
	2025	67	34,600		1,000	35,600
Fair Haven Municipal	Fair Haven					
	2005	2	400			400
	2010	3	600			600
	2015	3	600			600
	2025	3	600			600
Franklin County State	Highgate					
	2005	53	19,900		1,500	21,400
	2010	55	20,700		1,500	22,200
	2015	58	21,400		1,500	22,900
	2025	62	23,300		1,500	24,800
Hartness State	Springfield					
	2005	37	9,200		100	9,300
	2010	39	9,700		100	9,800
	2015	40	9,900		100	10,000
	2025	42	10,400		100	10,500
John H. Boylan State	Island Pond					
	2005	1	200			200
	2010	2	400			400
	2015	2	400			400
	2025	2	400			400

Table 4-26

Projections of Total Operations at Vermont's Public Use Airports, Continued

Airport Name	City Year	Based Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
Middlebury State	Middlebury					
	2005	50	31,450		800	32,250
	2010	52	32,700		800	33,500
	2015	54	34,000		800	34,800
	2025	58	36,500		800	37,300
Morrisville-Stowe State	Morrisville					
	2005	28	17,520		500	18,020
	2010	29	18,100		500	18,600
	2015	30	18,800		500	19,300
	2025	32	20,000		500	20,500
Mount Snow	West Dover					
	2005	7	6,600			6,600
	2010	8	7,500			7,500
	2015	8	7,500			7,500
	2025	9	8,500			8,500
Newport State	Newport					
	2005	17	6,960		180	7,140
	2010	18	7,400		180	7,600
	2015	19	7,800		180	8,000
	2025	20	8,200		180	8,400
Post Mills	Post Mills					
	2005	29	9,510			9,510
	2010	31	10,200			10,200
	2015	32	10,500			10,500
	2025	34	11,100			11,100
Rutland State	Rutland					
	2005	41	26,936	6,082	832	33,850
	2010	43	28,200	9,440	832	38,500
	2015	44	28,900	13,300	832	43,000
	2025	46	30,200	13,300	832	44,300
Shelburne	Shelburne					
	2005	56	3,000			3,000
	2010	58	3,100			3,100
	2015	59	3,200			3,200
	2025	62	3,300			3,300
Warren-Sugarbush	Warren					
	2005	70	22,500			22,500
	2010	73	23,500			23,500
	2015	76	24,400			24,400
	2025	82	26,400			26,400

Table 4-26

Projections of Total Operations at Vermont's Public Use Airports, Continued

Airport Name	City Year	Based Aircraft	GA Operations	Commercial Operations	Military Operations	Total Operations
William H. Morse	Bennington					
	2005	50	26,400		120	26,520
	2010	52	27,500		120	27,600
	2015	53	28,000		120	28,100
	2025	56	29,600		120	29,700

Source: FAA 5010 Airport Master Record, Wilbur Smith Associates

